GIANT GERM CELLS IN THE GRASSHOPPER.

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Giant somatic cells have often been described but so far as the available literature shows nothing but giant spermatids have been figured in the male germ cells of insects.[1] Mitotic figures of giant germ cells throw light upon the development of these abnormal spermatids.

One *Schistocerca* nymph about one third grown contained several giant cells in mitosis.

The earliest stage found was a secondary spermatogonium (Fig. 1) containing forty-six or more chromosomes. The chromosomes were so massed that it was difficult to determine the exact number, but the cell was equivalent to at least two ordinary cells (a typical spermatogonial cell contains twenty-three).

Two giant cells in first spermatocyte metaphase appeared; one of these did not show the chromosomes distinctly while the other (Fig. 2) contained twenty-nine chromosomes. As the number of chromosomes in the spermatocyte stages is reduced one half (to twelve) this giant cell corresponds to at least two normal cells.

An adult *Melanoplus* contained two giant first spermatocytes, each with twenty-four chromosomes, one was in late prophase and the other in metaphase.

A number of giant cells in first spermatocyte anaphase were found in the nymph already mentioned. Of these two are figured (Pl. I., Fig. 3, and Pl. II.). The cells were so large that they were divided into four pieces by sectioning. These pieces were easily distinguished by their relation to the surrounding cells. No doubt a few of the chromosomes were lost in sectioning, as one or two chromosomes were found detached from any cell.

There were fifty-four chromosomes passing toward one pole and forty-nine toward the other in the first of these cells.

[1] Paulmier, F. C., "The Spermatogenesis of *Anasa-tristis*," *Journal of Morphology*, XV.

In the second there were ninety-six on one side and eighty-one on the other. The first was equivalent to four or five cells and the last to eight cells. The chromosomes in these giant cells seem to act normally, that is, they divide and pass to the poles and maintain their individuality in every way, but the cell as a whole fails to divide.

In pathological mitosis the spindles are often multipolar and the number of chromosomes passing to each pole is then very unequal, while in these giant germ cells the mitotic figure is always bipolar and the number of chromosomes passing to each pole is nearly the same.

It may be that giant spermatozoa, formed from such cells as these just described, are the cause of monstrosities when they succeed in fertilizing an egg.

PLATE I.

FIG. 1. A giant secondary spermatogonium containing about forty-six chromosomes.

FIG. 2. An abnormal first spermatocyte with twenty-nine chromosomes.

FIG. 3. Chromosomes from a single first spermatocyte during anaphase. The cell of this figure and the cell represented in the succeeding plate were so large that they were each cut into four pieces in the process of sectioning. Fifty-four chromosomes toward one pole, forty-nine toward the other.

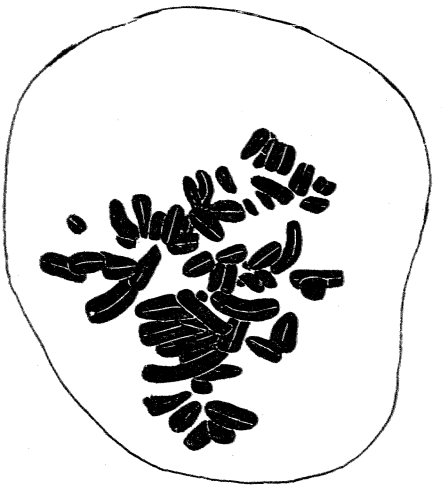


Fig. 1

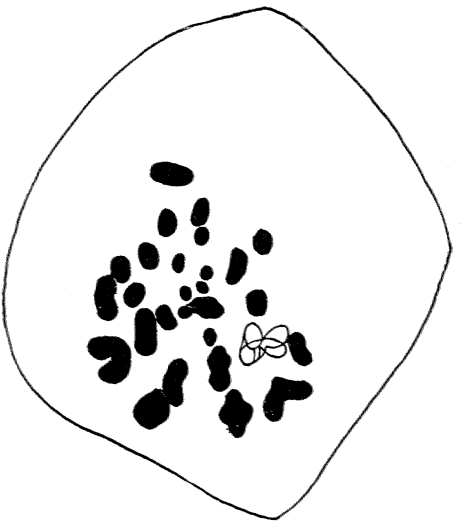


Fig. 2

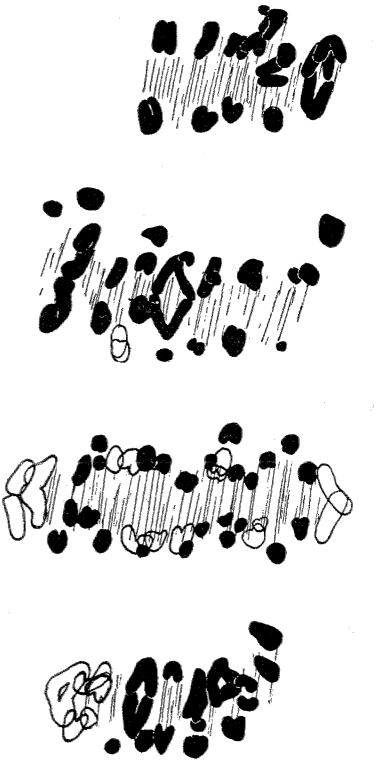
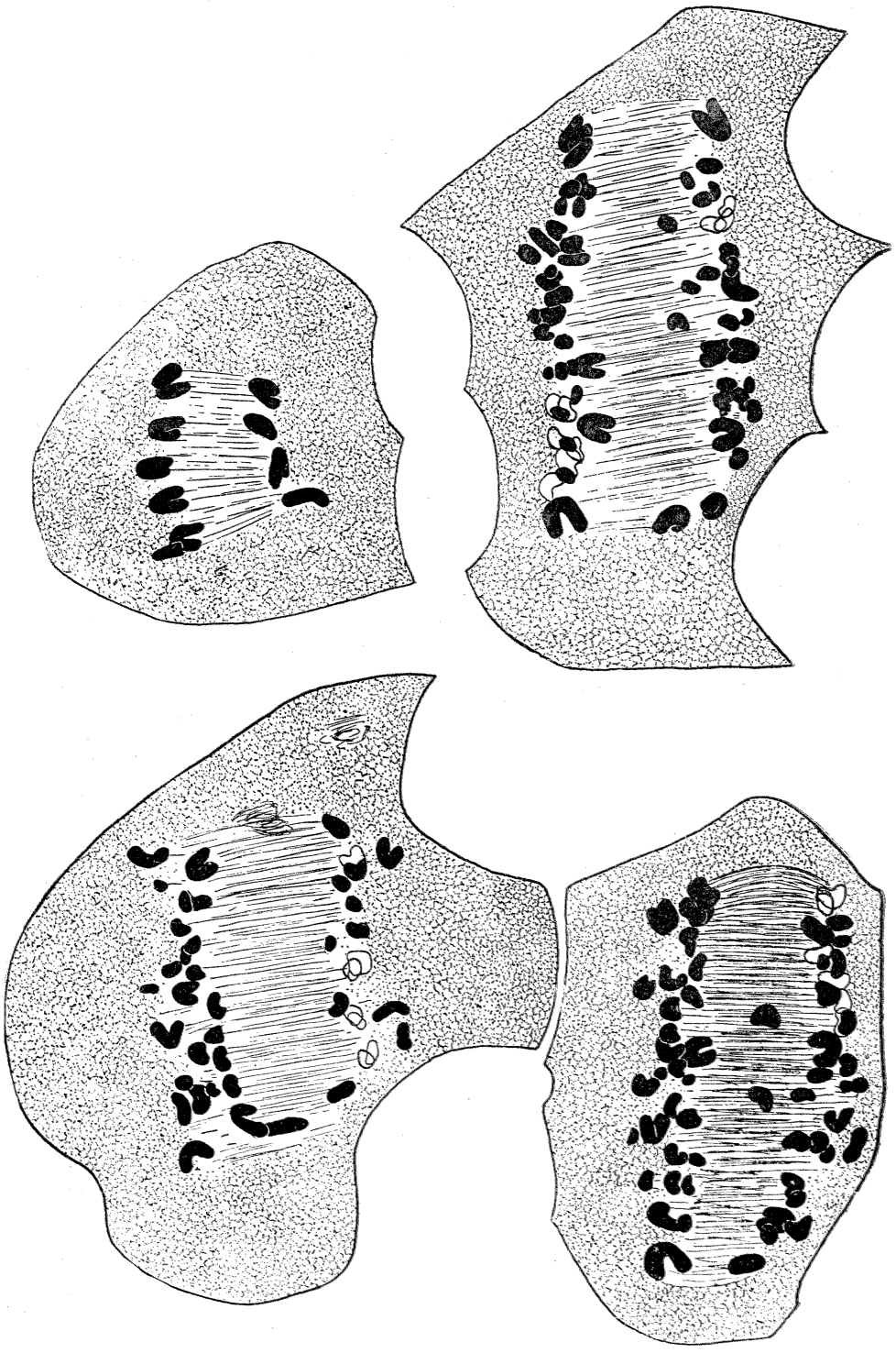


Fig. 3

PLATE II.

A giant first spermatocyte in anaphase with ninety-six chromosomes on one side and eighty-one on the other.



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